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Can garlic prevent, repel or kill fleas that infest dogs?

A Knowledge Summary by

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PICO question

In dogs, is oral or topical administration of garlic, compared to no treatment, efficacious at preventing or reducing parasitism by fleas?

Clinical bottom line

Category of research question

Treatment

The number and type of study designs reviewed

Zero

Strength of evidence

Critical appraisal of the selected papers meeting the inclusion criteria collectively provide zero evidence in terms of their experimental design and implementation

Outcomes reported

The outcomes reported were none

Conclusion

It is concluded that there is a lack of peer-reviewed scientific *in vivo* evidence to address the PICO

[How to apply this evidence in practice](#)

The application of evidence into practice should take into account multiple factors, not limited to: individual clinical expertise, patient's circumstances and owners' values, country, location or clinic where you work, the individual case in front of you, the availability of therapies and resources.

Knowledge Summaries are a resource to help reinforce or inform decision-making. They do not override the responsibility or judgement of the practitioner to do what is best for the animal in their care.

Clinical Scenario

A veterinary nurse is reading through the ectoparasiticide advice being given in a Facebook group that encourages a 'natural' (non-conventional medicine) approach to preventative medicine in dogs. She notices that garlic is being recommended quite frequently by some pet owners as an alternative to a conventional ectoparasiticide for preventing or treating flea infestation on dogs and wonders what the evidence base is for this recommendation.

The evidence

No peer-reviewed scientific papers were identified that addressed the PICO. Widening the inclusion criteria to include garlic applied environmentally (the same search strategy was retained) to address extra dog environmental infestation, or case studies based on oral, topical or environmental application of garlic also yielded no results.

Summary of the evidence

There was no peer-reviewed evidence that met the inclusion criteria to summarise.

Appraisal, application and reflection

No *in vivo* studies that examine the efficacy of garlic at preventing, killing or repelling any stage of the flea life cycle in dogs were identified from the search strategy applied, and therefore no papers met the inclusion criteria for this Knowledge Summary. One *in vitro* study (Renapurkar & Deshmukh, 1984) was identified which demonstrated that environmental application (on to filter paper) of garlic extract in a hexane solvent was efficacious with the LC50% (the concentrate that kills 50% of the animals tested on) concentration of garlic extracts similar to that for various organochlorine and organophosphorus (Dieldrin; Malathion; Fenthion; Dichlorodiphenyltrichloroethane). However, external validity (e.g. oral or topical application of garlic to the dog with, or at risk of, flea parasitism) should not be inferred from these findings due to the numerous differences between laboratory and clinical application.

There is some evidence of *in vitro* efficacy of garlic application across parasitised species and ectoparasites from various phyla, which suggests that it may have its place as a plant-based ectoparasiticide for the ethnoveterinary based treatment of some species. In two cattle-based studies (both abstract only as the full text was in Spanish), oral supplementation with garlic (100 g or 200 g per cow; Massariol et al., 2009) or garlic residue (3–9 g per cow; de Castro Alvarenga et al., 2004) resulted in a significant reduction in ticks, similar to those cattle treated with Amitraz 0.025% (Massariol et al., 2009). However, no significant effect was seen on horn, stable or house fly burden (Massariol et al., 2009). Similarly, topical (vent/abdomen; Birrenkott et al., 2000) or environmental (hen housing; Gorji et al., 2014) application saw a significant decrease in northern fowl mite by week 4 compared to baseline and the control group (Birrenkott et al., 2000) and an 85% reduction in red mite infestation after the first application (Gorji et al., 2014). Topical (Gholipour-Kanai et al., 2012; and Fridman et al., 2014) or oral (Fridman et al., 2014) application of garlic extracts have also been shown to effectively reduce or eliminate ectoparasitism by the protozoan *Ichthyophthirius multifiliis* (host was a Sail Fin Molly fish; Gholipour-Kanai et al., 2012) and various trematode Mongean species (host was a Guppy fish; Fridman et al., 2014). This cross phyla efficacy may suggest a tentative basis for clinical research to investigate the efficacy of garlic as a plant-based ectoparasiticide to prevent, repel or kill fleas in the domestic dog. However, until garlic has been shown to be efficacious against fleas in dogs (and at levels non-toxic to the canine) the veterinary professional cannot make assumptions of external validity based on the studies cited, and clients should be recommended to use instead an ectoparasiticide that has been demonstrated to be so.

Methodology Section

Search Strategy	
Databases searched and dates covered:	Pubmed on NCBI platform (01/01/1900 – 03/12/2019); Web of Science (1900 – 03/12/2019); CAB Abstracts on Ovid Platform (1973 – 2019, week 47); SCOPUS (1960 – 03/12/2019)
Search terms:	<p>PubMed: (dog OR dogs OR canine OR canid OR canis OR bitch OR bitches OR pup OR puppy OR puppies) AND (garlic OR “allium sativum”) AND (flea or fleas or Ctenocephalides or ectoparasiticide or ectoparasite)</p> <p>Web of Science: (dog OR dogs OR canine OR canid OR canis OR bitch OR bitches OR pup OR puppy OR puppies) AND (garlic OR “allium sativum”) AND (flea or fleas or Ctenocephalides or ectoparasiticide or ectoparasite)</p> <p>CAB Abstracts: (dog OR dogs OR canine OR canid OR canis OR bitch OR bitches OR pup OR puppy OR puppies) AND (garlic OR allium sativum) AND (flea or fleas or Ctenocephalides or ectoparasiticide or ectoparasite)</p> <p>SCOPUS: (dog OR dogs OR canine OR canid OR canis OR bitch OR bitches OR pup OR puppy OR puppies) AND (garlic OR “allium sativum”) AND (flea or fleas or Ctenocephalides or ectoparasiticide or ectoparasite)</p>
Dates searches performed:	03 Dec 2019

Exclusion / Inclusion Criteria	
Exclusion:	Pre-defined exclusion criteria: non-English language, popular press articles, in vitro studies, conference abstracts
Inclusion:	Any comparative study in which the effect of orally or topically administered garlic on flea parasitism of the dog was studied

Search Outcome						
Database	Number of results	Excluded – did not address the PICO	Excluded – not English language	Excluded – conference abstract only	Excluded – duplicates	Total relevant papers
PubMed	1	1	0	0	0	0
Web of Science	1	1	0	0	0	0
CAB Abstracts	1	1	0	0	0	0
Scopus	2	2	0	0	0	0
Total relevant papers						0

CONFLICT OF INTEREST

The author declares no conflicts of interest.

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